

ABSTRACT

A ceramic thermal barrier coating material (10) containing nano-sized features is predicted to exhibit improved high temperature performance than a comparable material containing fewer of such features. In a coating deposited by an APS process, the nano-sized features may be intersplat columns (32). In a coating deposited by an EB-PVD process, the nano-sized features may be a mixed oxide layer (22) formed of nano-sized mixed oxide particles, or nano-sized alumina projections (24) extending across the interface from the mixed oxide layer into the insulating material layer (20). Alternatively, the nano-sized features may be secondary columnar grains (36) extending laterally from primary columnar grains (34) in a columnar-grained ceramic material.